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BUMPER FOR AN AUTOMOBILE
[Jodosha Yo Bampa]

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Specification

1. Title of the invention

Bumper for an automobile

2. Patent Claim

1. A bumper for an automobile characterized by the facts that it is constituted by a bumper frame fixed to the body frame of an automobile, a flexible bumper skin fixed, in an elastically deformable fashion, to said bumper frame or body frame, and an energy absorber which possesses large numbers of punch-through holes punching through the frontal & rear directions of said body frame and which is configured between the aforementioned bumper frame and bumper skin and that air introduction paths designed to guide air from frontal to rear sides are formed by configuring, on both of the aforementioned bumper skin and bumper frame, openings linked respectively to the punch-through holes of the aforementioned energy absorber.

3. Detailed explanation of the invention

The present invention concerns a bumper designed to become fitted onto an automobile, especially a front bumper.

Front bumpers for automobiles known in the prior art are instantiated by a constitution wherein, in attempts not only to improve the physical appearance but also to upgrade the shock absorbability, an elastically deformable flexible bumper skin is attached fixedly to a bumper frame scheduled to become fixed to a body frame and wherein an energy absorber in possession of large numbers of honeycomb-shaped punch-through holes punching through the frontal & rear directions of said body frame is configured between said bumper skin and bumper frame.

¹ Numbers in the margin indicate pagination in the foreign text.

Morphologically speaking, however, such a bumper becomes rather large, and in a case where said bumper is attached to the front end of the body frame in accommodation of the nose-down design of the bumper frame front end, which has become recently popular in the contexts of attenuating the air resistance and of improving the physical appearance, it becomes difficult to secure a sufficient transient air introduction area on the body frame front end, as a result of which it becomes impossible to feed sufficient cooling air into a radiator, etc. within the engine room, which is problematic in that the engine cooling efficiency deteriorates.

The objective of the present invention, which has been conceived in acknowledgment of the foregoing circumstances, is to provide, by taking advantage of honeycomb-shaped punch-through holes of the aforementioned energy absorber punching through the frontal & rear directions of the body frame, a bumper for an automobile capable of improving the engine cooling efficiency based on a constitution wherein openings linked respectively to the aforementioned punch-through $\frac{1}{2}$ holes are configured on the bumper skin and bumper frame for forming air introduction paths designed to guide air from frontal to rear sides in such a way that sufficient cooling air can be fed into the radiator, etc. without sacrificing the improved physical appearance and excellent shock absorbability.

In the following, the present invention will be explained in detail with reference to application examples shown in figures.

Figure 1 and Figure 2 each show the front bumper A of the present invention, where (1) is a bumper frame with a virtual \sqsupset -shaped cross-sectional shape designed to extend between left & right and to become fixed to the front end of a body frame (not shown in the figure), whereas (2) is a bumper skin that covers the surface of said bumper frame (1). Said bumper skin (2) is made of a urethane resin, etc. and is flexible in an elastically deformable fashion, whereas the rear ends of its upper & lower portions are fixed respectively to the upper & lower portions of the bumper frame (1) via the screws (3) & (3).

The energy absorber (4), furthermore, is configured in-between the aforementioned bumper frame (1) and bumper skin (2) in a state where the rear end plane thereof is being attached fixedly to the surface of the bumper frame (1). Said energy absorber (4) is made of a urethane resin, etc., as in the case of the aforementioned bumper skin (2), and possesses large numbers of honeycomb-shaped punch-through holes (5), (5), ... punching through the frontal & rear directions of the body frame.

Moreover, large numbers of virtually rectangular openings (6), (6), ... linked respectively to the honeycomb-shaped punch-through holes (5), (5), ... of the aforementioned energy absorber (4) are drilled into the aforementioned bumper skin (2) by means of punching, etc., whereas large numbers of openings (7), (7), ... linked respectively to the honeycomb-shaped punch-through holes (5), (5), ... of the aforementioned energy absorber (4) are likewise formed on the aforementioned bumper frame (1), as in the case of the aforementioned bumper skin (2), based on which air introduction paths (8), (8), ... designed to guide, from the frontal side of the front bumper A, transient air (cooling air) into an engine room behind the front bumper A via the openings (6) & honeycomb-shaped punch-through holes (5) of the bumper skin (2) and the openings (7) of the bumper frame (1) become formed.

As far as the aforementioned application example is concerned, therefore, openings (6), (6), ... and openings (7), (7), ... linked to the honeycomb-shaped punch-through holes (5), (5), ... punching through the frontal & rear directions of the body frame are configured respectively on the bumper skin (2) and bumper frame (1), and since the air introduction paths (8), (8), ... designed to guide air from frontal to rear sides of the front bumper A are formed, transient air becomes smoothly introduced, via the aforementioned air introduction paths (8), (8), ..., into the engine room within a running automobile, and it becomes possible to introduce sufficient cooling air (transient air) even into a body frame of a style incapable of securing a sufficient transient air introduction area on the front end thereof, as in the case of a nose-down model, as a result of which it becomes possible to feed sufficient air into the radiator, etc., to cool the engine efficiently, and to effectively utilize the respective spaces of the frontal & rear ends of the body frame.

The aforementioned air introduction paths (8), furthermore, are formed by taking advantage of the punch-through holes (5) of the energy absorber (4), based on which a simplified structure can be provided, and effects of reducing the number of objects, number of processes, and the cost can be achieved.

The shock at the time of collision can, furthermore, be absorbed and alleviated by the aforementioned honeycomb-shaped energy absorber (4), based on which a favorable shock absorbability can be ensured, and there is no need to sacrifice the physical appearance, for the openings (6), (6), ... alone are formed on the bumper skin (2), which is visible from the outside.

Incidentally, the rear end portion of the bumper skin (2) is attached fixedly to the bumper frame (1) in the aforementioned application example, although it goes without saying that the rear end of said bumper skin (2) may instead be extended backward and then attached fixedly to the body frame.

As the foregoing explanations have demonstrated, the bumper of the present invention is constituted by a bumper frame fixed to the body frame of an automobile, a flexible bumper skin fixed, in an elastically deformable fashion, to said bumper frame or body frame, and an energy absorber which possesses large numbers of punch-through holes punching through the frontal & rear directions of said body frame and which is configured between the aforementioned bumper frame and bumper skin, whereas since air introduction paths designed to guide air from frontal to rear sides are formed by configuring, on both of the aforementioned bumper skin and bumper frame, openings linked respectively to the punch-through holes of the aforementioned energy absorber, transient air (cooling air) can be sufficiently fed into an engine room without sacrificing the improved physical appearance and excellent shock absorbability, and it becomes possible to feed sufficient air into the radiator, etc., to cool the engine efficiently, and to effectively utilize /3 the respective spaces of the frontal & rear ends of the body frame. Since a simplified structure is provided, furthermore, advantageous effects of reducing the number of objects, number of processes, and the cost can concomitantly be achieved.

4. Brief explanation of the figures

Figures demonstrate an application embodiment of the present invention, where Figure 1 is a lengthwise transverse profile plane view diagram, whereas Figure 2 is a dissembled oblique view diagram.

(A): Front bumper; (1): Bumper frame; (2): Bumper skin; (4): Energy absorber; (5): Punch-through holes; (6) & (7): Openings; (8): Air introduction paths.

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Figure 1

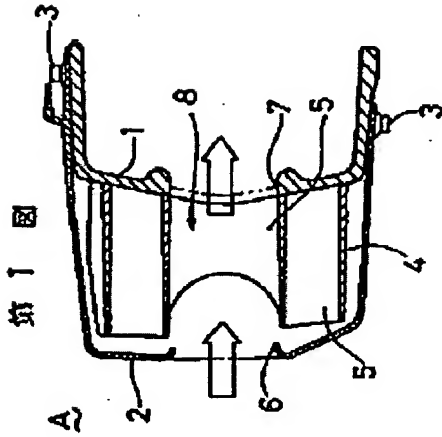


Figure 2

